
Fixed Ics Fusion Final Aroma Zip

[Download](#)

Download

.Two-dimensional magnetic properties of the chromium doped iron oxide and chromium-doped iron-niobium-carbonate magnetite nano-particles synthesized by facile precipitation method. Cr-doped Fe-Nb-C, Fe-Cr-Nb-C, and Fe-Nb-C magnetite ($\text{Fe}_{3-x}\text{Cr}_x\text{O}_4$, $x = 0.05, 0.10, 0.20, 0.25, 0.30, 0.35, 0.40, 0.45, 0.50, 0.55, 0.60, 0.65, \text{ and } 0.70$) nanocrystals were synthesized by the facile precipitation method and characterized by various techniques. The crystalline structure of the prepared nano-particles was confirmed by X-ray diffraction (XRD) and high resolution transmission electron microscopy (HRTEM). From the XRD patterns, it was observed that the average crystallite size of the synthesized nano-particles decreases with increasing Cr-doping concentration, except in the case of Fe-Nb-C and Fe-Nb-C-0.50 samples. The X-ray photoelectron spectroscopy (XPS) spectra showed that Fe 2p, Nb 3d and Cr 3p states are present on the surface of the Cr-doped nano-particles. The energy dispersive X-ray (EDX) analysis showed that the Cr-doped Fe-Nb-C and Fe-Cr-Nb-C nano-particles are composed of Fe, Nb, and Cr elements. From the results of magnetization (M)-H curves, it was observed that all the prepared nano-particles are superparamagnetic at room temperature. The M-H curves showed a magnetization saturation at 0.5 Tesla with the increase in Cr-doping concentration. The M-H curve of Cr-doped Fe-Nb-C nano-particles showed high remanent magnetization (M_s) and the value of M_s increased with Cr-doping concentration. It was also observed that the coercive field (H_c) decreased and the squareness (S) increased with increasing Cr-doping concentration. The M-H curves also indicated that the two-dimensional (2-D) ferromagnetic behavior is more pronounced in Cr-doped Fe-Nb-C nano-particles than in

